2-8 per cent.+H 8'2 per cent.+N 55-1 per cent., and the combustible value of 1 cubic metre of this gas is 1,507 calories.

As is apparent, distillation gas, viz., 0*42 cubic metre, only forms about 8 per cent, of the quantum of gas, and the quantity of steam-air gas amounts to about ten or eleven times that of the distillation gas. Producer gas, therefore, consists in the main of steam-air gas, and this points, therefore, to devoting quite special attention to its production. There is, therefore, no compulsory ground for production of bad steam-air gas, since all conditions for properly carrying out the process of its production are clear, and no serious difficulties are in the way of their exact observance. Also, it is on the steam-air gas portion of the gas alone on which the exercise of thought is capable of favourable influence, since the amounts and compositions of the distillation gases are fixed in the fuel by Nature, and therefore cannot be improved. We are, however, in a position by sudden introduction of a large quantity of coal into the producer, when it is quite hot, momentarily to produce a large quantity of distillation gas, and thereby an improvement in the quality of the gas, as is frequently wished for by practical people; but it can only be of short duration, and naturally have as a consequence the production of a producer gas poor in distillation gas for a longer period. But besides, it involves as a consequence of retrogression and periodical improvement of the quality of the gas no economical use of the fuel throughout, since under the attack of high heat, the highly carbonaceous bituminous substances, by setting free C, decompose into lighter hydrocarbons, and liberated C appears in the form of dust or soot, which is carried away from the producer, and can no longer be brought into use. They deposit themselves for the most part in the conduits, obstructing them, and finally interrupting the working.

Further, as shown in what follows,-faults in the production of the steam-air gas unfavourably influence the composition of the distillation gas, and finally are able partly, or completely, to annul the advantages which it is possible to obtain from the employment of bituminous (often costly) fuels.